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THE SCIENTIFIC METHOD IN THEOLOGY.

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THE recent correspondence between Professor St. George Mivart and Cardinal Vaughan concerning the Professor's recent articles on the relation of educated Roman Catholics to the Bible, marks a most significant epoch in the history of religious thought. It brings most strikingly to view the fact that the time is past when any one can serve the cause of true religion by ignoring the methods of modern science. It also makes clear and vivid the necessity of establishing our theological beliefs on just the same scientific basis as our beliefs in any other sphere of inquiry, if they are going to influence in any effective way the thought of the future.

The aim of the present paper is to set forth with clearness the principles that underlie all our beliefs, and then to show how these principles are to be applied to the particular field of investigation we now have in view.

It is customary in discussing the method of science to go back to Aristotle and treat of the subject under the two distinct heads of induction and deduction. But we now see that the two methods are not wholly independent of each other. In reality, they are frequently blended or employed alternately in the pursuit of science. It is no exaggeration to say that all the more important and extensive investigations of science rely as much upon the one as upon the other. In both, the syllogism, with its major and minor premises and conclusion, holds the foremost place. For the syllogism is not only the form of deductive reasoning, but it is the true type of all reasoning properly so called. It may not be always necessary to express an argument in the form of a syllogism, but it must always be thrown into this form when scientific accuracy is required.

While there is little or no disagreement among thinkers about the nature and place of deduction in science, there is often a great deal of controversy over the sphere and proper function of induction. This arises from the fact that the term induction may be employed in at least three different senses.

In the first place, induction may be used to designate the old Socratic method of attaining definitions. This consists simply in enumerating all the particulars of a class. It is what is sometimes called a perfect induction; and, although it is in the form of reasoning, it is not reasoning at all. All we do in such a case is to solve a simple problem in addition and state the result.

Induction, according to the second meaning given to the term, is any process of adding to our knowledge. It was Bacon's chief objection to the Aristotelian logic that its premises were all taken for granted. It could never, in his opinion, in any way increase our knowledge. He therefore asked the question, How do we obtain our knowledge, and how do we progress in it? His answer to the question was, By induction; and, as contrasted with the old method, the term took on the meaning of any process that adds anything to what we already know at any given time. But this view of induction is too broad, just as the first view is too narrow. It includes every other mode of acquiring knowledge as well as reasoning, while the first view excludes reasoning altogether.

The third and most rational definition of induction represents it as the process of thought by which we pass from particulars to generals, or from effects to their causes. It is only in this sense that it can in any way be brought into contrast with deduction, as one of the essential methods employed in the pursuit of science.

Of course, the chief preliminary step in any induction is the acquisition of the particulars, and this can only be done by the two processes of observation and experiment. But they do not form any part of induction properly so called. The mere ascertainment of facts does not make a scientist. There are a thousand workers in science to one scientist. The most exact observers and the most skilful experimenters are not, by any means, the best scientists. Quite the opposite is probably the rule. Many of the world's greatest scientists have been notoriously defective in this respect. Nevertheless, a highly developed science, in any department of knowledge, is possible only upon the basis of a large supply of carefully ascertained facts.

The great and distinctive element in all induction is the formation of the hypothesis; and there can be no inductive science formed of any sort where this is not the chief feature.

What, then, is to be understood by an hypothesis, and what is the process the mind goes through in bringing it to view? An hypothesis is a supposition, a guess, or conjecture as to what the general fact is which includes the given particular facts, or what the cause is which has brought about the given effects. The term is sometimes contrasted with the term "theory," as though the two were necessarily distinct; an hypothesis being regarded as a mere possibility, while a theory is called a verified hypothesis. But this view is largely an arbitrary one, as the terms are often used interchangeably, as when we speak indifferently of the Darwinian hypothesis or the Darwinian theory.

Much might be said about the conditions most favorable for making a good hypothesis, but the chief thing that concerns us for our present purpose is the fact that every hypothesis, however formed, is always a product of the constructive imagination. All previous acts are simply by way of gathering material for the imagination to rearrange and recombine into a new creation.

In a certain sense, the mind takes a leap into the dark. It literally passes, *per saltum,* from the realm of the known to the realm of the unknown. From all the material that the memory places at its disposal it makes a guess or conjecture as to what will best meet all the exigencies of the situation.

It is for this reason that men of science, in all realms and in all ages, have always been men of powerful imaginations. The Greeks were the first great scientists of the race, because they were far more highly endowed than any other people with great imaginative powers. What they saw excited these powers and urged them to conjecture, to reason about things, and try to explain their nature and cause. It was well said by Dr. Carpenter that "it cannot be questioned, by any one who carefully considers the subject under the light of adequate knowledge, that the creative imagination is exercised in at least as high a degree in science as it is in art or poetry. Even in the strictest of sciences—mathematics—it can easily be shown that no really great advance, such as the invention of fluxions by Newton and of the differential calculus by Leibnitz, can be made without the exercise of the imagination."

Given the hypothesis, the next step in the scientific process is to verify it; and this is done by making the hypothesis the major premise of a deductive syllogism and noting the results. If the conclusions obtained coincide with the observed facts with which we started, the hypothesis is *probably* a correct one, and, others things being equal, may be accepted as an established truth.

From this outline of the scientific method we see that no induction can be established beyond a high degree of probability. That is, no one can ever be absolutely certain that the hypothesis he assumes is a veritable truth. All generalizations in every science thus have their logical basis in the theory of probabilities.

When Bishop Butler asserted that "probability is the very guide of life," he might have added, "and we have no other." For all our judgments of what the past has been, or the present is, or the future will be, are necessarily formed on that basis; and as we are finite creatures and can never have infinite knowledge on any of these subjects, the knowledge we do have can never be more than probable.

The truth is that every man is so constituted by nature that he can never be absolutely certain of anything outside of the facts of his own consciousness and the simple intuitions necessarily involved therein; and when he makes an assertion transcending this realm, he passes at once into the sphere of the probable.

What we know with absolute certainty is never a matter of inference. It is never the result of a process of reasoning. It is always known directly, at once, by an immediate beholding. It is easy to see, therefore, that the realm of absolute certainty is a clearly limited one, and that the realm of probability includes within itself the great body of our knowledge. I am absolutely certain that I experience sensations, that I who experience them exist, and that the sensations have a cause; but I can be only probably certain that this particular concrete object was the cause. It is exceedingly easy for the most cautious person living to be mistaken in his judgments, and to draw wrong inferences from the *data* furnished by any one or all of his senses; and he can never be absolutely certain that he draws the right one. All the wisest man in the world can do is carefully to estimate the probabilities in the case and act accordingly. To say of a thing, "I have seen it with my own eyes," is only to make its existence probable; and to obey the injunction, "Handle me and see," can give only probable knowledge.

In every discussion of this sort a clear distinction should always be made between intuitively knowing and believing. I intuitively know a thing to be true when I am absolutely certain of it; I believe a thing to be true when I fall short, however little, of such certainty. That is to say, belief is simply imperfect knowledge. It is any kind of knowledge, in any sphere, which fails, in any respect, of being absolute. No proposition, perhaps, is more familiar to a beginner in logic than the statement, "All men are mortal," but even that assertion can be to him nothing more than a matter of a high degree of probability. For he has known only a very few men in the past, and as to those who may come to exist in the future he cannot positively assert that they will possess that property. He simply believes the proposition to be true, in just the same way, and no other, as he might believe in a material heaven, or a mountain of gold, or the real existence of a centaur.

Every natural scientist, I suppose, accepts and teaches the doctrine that every particle of matter attracts every other particle directly as the mass and inversely as the square of the distance. But he has examined only a few of the particles; and, from the very nature of the case, he can never be certain that those he has not examined are exactly like those he has. The doctrine furnishes him with a good working hypothesis. The probabilities are very high in its favor. But all he has any right to say about it is that he believes in the law of gravitation, not that he is absolutely certain of its truthfulness.

And so it is when we come to the realm of theology. We employ the same finite powers of mind in constructing a theology as in forming a science of botany or of physics. There is no difference in the kind of knowledge we have of each, but only in the class of objects taken into consideration. And my faith in the truth or falsity of their respective doctrines, and the degree of my faith in them, should always vary with the degree of their probability.

Theology, properly understood, is the science which seeks to account for the universe from the standpoint of God. It attempts to put all the known facts together into a system around this idea. It does not draw its material from any alleged revelation alone, although the revelation, if true, will furnish some of its most important *data*. But it gathers its material from every realm of knowledge. Every new fact discovered in any quarter of the universe increases its material, and every old supposed fact exploded diminishes it.

Now, all the facts that any man can possibly know may best be divided, for our present purpose, into two classes, internal facts and external facts. By internal facts we mean the facts of one's own consciousness, and by external facts, all else that can be mentioned. The former are certain to one, the latter merely probable. Every man who constructs a botany, or a geology, or any other science, makes it out of probable facts only. Every man who writes a history states and explains nothing of which he can be more than probably certain. How evident it is, then, that he who seeks to give unity to all the sciences, to explain the universe in which the great mass of the facts are only probable, can never attain to more than a probable solution of the problem, and can never justly ask another to accept his conclusions on any other ground than the high degree of their probability.

Great thinkers, from Thales, Plato and Moses, have had their theologies—their explanations of the origin and nature of the universe, as they understood it, and many of these explanations have been of extraordinary merit; but even St. Paul himself could never have been certain that his explanation was more than a probably true one.

Three great systems of theology are presented in the New Testament. Some prefer that of St. Paul; some find the Petrine theology more to their mind; while others adhere to that of St. John. The Apostles' Creed contains, perhaps, the sum and substance of all three; but no assertion in it transcends the realm of the probable. A brief examination of the creed itself will make this apparent. It begins with the statement, "I believe in God, the Father Almighty, Maker of heaven and earth." Now, the existence of the Absolute back of nature and all finite being, like one's own existence, is a matter of positive certainty; but any assertion concerning the nature of that Absolute, since it is an induction from probable facts, can never be more than probable. When we say, therefore, with the creed, that God is the Father Almighty, Maker of heaven and earth, we are asserting something about the nature of the Supreme Being of which no man can be more than probably certain. The degree of confidence we are justified in having in this statement depends on the degree of its probable truthfulness.

Take, again, the statement of the creed concerning the nature and mission of Jesus: "And in Jesus Christ, His only Son, our Lord; who was conceived by the Holy Ghost, born of the Virgin Mary; suffered under Pontius Pilate, was crucified, dead and buried; He descended into hell; the third day He rose from the dead; He ascended into heaven, and sitteth on the right hand of God, the Father Almighty; from thence He shall come to judge the quick and the dead."

Whether there ever existed on the earth such a person as Jesus, and what He experienced, are purely matters of historical evidence. And as everything that is a matter of evidence is a matter of probability, this must be also. We can never be absolutely certain that those who wrote His history were really acquainted with the facts of His life, or have honestly represented them, or that their testimony, after being once recorded, has not been so frequently and radically altered as to give us to-day, in some respects, an erroneous conception of the truth. Even if we regard the record as it stands as veritable history, the doctrine of the actual divinity of Jesus, that He is in reality Son of God as well as Son of man, is an induction from certain alleged facts, and can, therefore, never be established beyond all possible doubt.

The creed closes with the affirmation: "I believe in the Holy Ghost; the Holy Catholic Church; the communion of saints; the forgiveness of sins; the resurrection of the body; and the life everlasting."

The writer of this passage, from the *data* that he had before him, simply drew the conclusion that the arguments in favor of these propositions were far stronger than those against them; and, accordingly, he was ready to say concerning them, as he does say in the statement itself, "I believe"—not "I am absolutely certain of their truthfulness."

But it makes no difference to the matter in hand from what source he obtained his information. Even if we allow that every word in Scripture came directly from the lips of the Almighty, no man could ever be more than probably certain that he correctly heard the words when they were uttered, or correctly wrote them down, or correctly understood them after they were written, either by themselves or in their mutual relations. There is always room for possible doubt concerning any of these assertions; and all that the profoundest thinker can do for them is to establish their probable truthfulness.

What we have said concerning the so-called Apostles' Creed applies with equal force and validity to every creed in Christendom and to every system of theology, however elaborately constructed or however dogmatically expressed. The most certain of their generalizations are probable, and probable only, and those who teach them are never justified in urging their acceptance upon others on any other ground. The only theology that has any basis for its existence is an inductive theology; and just as "all inductions in physical science are only probable," so they are in theological science also.

It is never necessary, in fact it is never possible, to do more for any doctrine in any department of inquiry than to show that the balance of probabilities is in its favor. When we have shown that, we have made the doctrine worthy of credence, we are entirely justified in accepting it as a truth and adopting it as a rule of conduct.

He who says of any generalization in any sphere of thought that he will not accept it as true until he is absolutely certain of it, literally does not know enough to eat when he is hungry, or to drink when he is thirsty. The conduct of an ordinary idiot would put him to the blush. As John Locke so tersely puts it, "He that will not stir until he infallibly knows that the business he goes about will succeed, will have but little else to do but to sit still and perish."

Every man, because he is a man, is endowed with powers for forming judgments, and he is placed in this world to develop and apply those powers to all the objects with which he comes in contact. In every sphere of investigation he should begin with doubt, and the student will make the most rapid progress who has acquired the art of doubting well. But doubt is simply a means to an end, not an end in itself. We begin with doubt in order that we may not end with it. To continue to doubt after the material for forming a judgment is before the mind, is a sign of weakness. The man who does so commits intellectual suicide. All you can do for him is to give him a decent burial and pass on.

We ask that every student of theology take up the subject precisely as he would any other science; that he begin with doubt, and carefully weigh the arguments for every doctrine, accepting or rejecting each assertion according as the balance of probabilities is for or against it. We demand that he thoroughly "test all things," and thus learn how to "hold fast that which is good."

We believe that even the teachings of Jesus should be viewed from this standpoint, and should be accepted or rejected on the ground of their inherent reasonableness. But we also firmly believe that the probabilities that He spoke the truth are so high that they can never be made any higher; that, when His doctrines concerning God and man and nature are correctly apprehended, it will clearly be seen that they fully satisfy the demands of the intellect and the cravings of the heart. And we do not regard it as at all likely that any theology of the future will have much influence over the minds of the thoughtful, that does not draw its chief and most important *data* from that source.

Superficial critics call the age in which we live an age of novel-reading and devotion to trifles; but the more thoughtful observer does not hesitate to affirm that it is unsurpassed in earnestness.

True, it is disinclined to acknowledge the supernatural. True, it is more inquiring than asserting, more doubting than believing. Yet, there probably never has been a time in our history when purely spiritual questions have been so widely and seriously discussed as at present. The creeds of the world, both Christian and un-Christian, have never before been studied with such universal interest, or criticised with such unsparing vigor.

In fact, the one pre-eminent demand of the present hour is a truly scientific theology—not a Chinese nor a Roman nor an Anglican theology, not a Baptist nor a Methodist nor a Presbyterian theology, not a Mosaic nor exclusively a Pauline theology, but a theology so cautiously constructed as to exclude all fiction, and so profound and comprehensive in its teachings as to include all the facts.

But this imperative need of the age will never be satisfied until every student of the subject clearly recognizes the fact, and constantly applies it, that in theology, as in every other department of knowledge, all generalizations are matters of a high or a low degree of probability, to be accepted or rejected according as the balance of probabilities is for or against them; and that the degree of confidence we should have in such generalizations is to be determined by the degree of their probable truthfulness.

This position, it may be said, requires that all our theological opinions should be very largely regarded as products of faith. We admit it at once, and we reply that this is true of all opinions. Faith lies at the basis of every science. So far from faith commencing where science ends, "there could no more be science without faith than there could be extension without space."

What Professor Rice has so fittingly said in his "Twenty-five Years of Scientific Progress" about the physical sciences applies with equal relevancy here: "From the clear recognition of the extremely narrow limits within which certitude is attainable, we may learn the rationality and wisdom of acting upon beliefs which are probable, and acting with an earnestness proportionate to the importance of the interest involved. We may learn to walk by faith more steadily by perceiving that, in this universe in which we live, only he who is willing to walk by faith can walk at all."

FRANK SARGENT HOFFMAN.